

Application No. 10/019,148

VERSION WITH MARKINGS TO SHOW CHANGES MADE

Please amend claims 1-20 as follows:

1. (Amended) An [E]electro-mechanical drive device for an adjustment device[s] of a motor vehicle, ~~[more particularly for a window lifter, which has]~~comprising:

a gearing with a gear housing [~~(A2, A2', B2, C2, D2, E2', D2'')~~];

an electric motor [~~(A1, C1, D1, D1'')~~] mechanically connected to the gearing;

a control device [~~(A5, A5', B5, C5, D5', D5'', E5)~~] mounted in the gearing housing [~~(A2, A2', B2, C2, D2, D2', D2'')~~] and having at least one power semi-conductor for controlling the electric motor [~~(A1, C1, D1, D1'')~~]; and

means [~~(A9, A9', B9, C9, D9, D9', D9'', E9)~~] thermally coupled to the at least one power semi-conductor as a heat sink for drawing off waste heat from the at least one power semi-conductor, wherein the means [~~(A9, A9', B9, C9, D9, D9', D9'', E9)~~] is [are] integrated in the gear housing [~~(A2, A2', B2, C2, D2, D2', D2'')~~].

2. (Amended) An [E]electro-mechanical drive device according to claim 1, ~~[characterised in that]~~ wherein for the purpose of coupling, the means [~~(A9, A9', B9, C9, D9, D9', D9'', E9)~~] and a power semi-conductor housing [~~(A5, A5', B5, C5, D5', E5)~~] are fixed with force-locking engagement against one another in order to reduce a heat transfer resistance.

3. (Amended) An [E]electro-mechanical drive device according to claim 2, ~~[characterised in that]~~ wherein for the force-locking engagement, [connection] the means [~~(A9, A9', B9, C9, D9, D9', D9'', E9)~~] is [are] spring-tensioned through a spring element against the power semi-conductor housing [~~(A5, A5', B5, C5, D5', E5)~~].

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4. (Twice Amended) An [E]lectro-mechanical drive device according to claim 1, [~~characterised in that~~] wherein a heat conducting means is mounted for thermal coupling between the means [~~(A9, A9', B9, C9, D9, D9', D9'', E9)~~] and a power semi-conductor housing [~~(A5, A5', B5, C5, D5', D5'', E5)~~].

5. (Twice Amended) An [E]lectro-mechanical drive device according to claim 1, [~~characterised in that~~] wherein the gear housing [~~(A2, A2', B2, C2)~~] has an opening for inserting the means [~~(A9, A9', B9, C9)~~] and guide elements for positioning the means [~~(A9, A9', B9, C9)~~] in an end position, and [~~that~~] the [~~inserted~~] means [~~(A9, A9', B9, C9)~~] is [~~in particular~~] lockable in the end position.

6. (Twice Amended) An [E]lectro-mechanical drive device according to claim 1, [~~characterised in that~~] wherein the means [~~(C9, D9, D9', D9'', E9)~~] [~~are~~] is injection moulded at least in part in an injection moulded plastics housing [~~(C2, D2, D2', D2'')~~] of the gearing.

7. (Twice Amended) An [E]lectro-mechanical drive device according to claim 1, [~~characterised in that~~] wherein the gear housing has supporting parts, the means [~~(C9, D9, D9', E9)~~] is [~~are~~] hermetically sealed in the gear housing [~~(C2, D2, D2')~~] against fluids and dust particles, and [~~that~~] the means [~~(C9, D9, D9', E9)~~] is [~~are~~] positioned against a wall [~~(C92, D92, D92')~~] of the gear housing [~~(C2, D2, D2')~~] wherein the wall [~~(C92, D92, D92')~~] is thinner than the supporting parts of the gear housing [~~(C2, D2, D2')~~ in order to have a lower heat transfer resistance].

8. (Twice Amended) An [E]lectro-mechanical drive device according to claim 1, [~~characterised in that~~] wherein the means [~~(C9, D9, D9', D9'', E9)~~] [~~have~~] acts as a heat conductor [~~(C9, D9, D9',~~

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~~D9', E9')~~ and is coupled ~~[a further coupling]~~ with a cooling element to discharge the waste heat diverted away from the at least one power semi-conductor to the cooling element, and ~~[that]~~ the cooling element is ~~[in particular]~~ a support plate on which the gear housing ~~[(E2, D2, D2', D2'')]~~ is fixed.

9. (Amended) An ~~[E]~~electro-mechanical drive device according to claim 8, ~~[characterised by]~~ further comprising a mechanical connection between the heat conductor ~~[(E9, D9, D9', D9'', E9)]~~ and the gear housing ~~[(E2, D2, D2', D2'')]~~, and ~~[by]~~ a fastening element ~~[(E90, D90, D90', D90'', E90)]~~ integrated in the heat conductor ~~[(E9, D9, D9', D9'', E9)]~~ for fixing the gear housing ~~[(E2, D2, D2', D2'')]~~ on the cooling element.

10. (Twice Amended) An ~~[E]~~electro-mechanical drive device according to claim 1, ~~[characterised in that]~~ wherein a bearing ~~[(E9115)]~~ for a gear element ~~[(E115)]~~ of the gearing is integrated in the means ~~[(E9)]~~.

11. (Amended) An ~~[E]~~electro-mechanical drive device according to claim 10, ~~[characterised in that]~~ wherein the means ~~[(E9)]~~ ~~[have]~~ has positioning elements for positioning the control device ~~[(E2)]~~ relative to at least one of the gear element ~~[(E115) or to]~~ and a magnet ~~[(E1155)]~~ fixed on the gear element ~~[(E115)]~~.

12. (Twice Amended) An ~~[E]~~electro-mechanical drive device according to claim 1, ~~[characterised in that]~~ wherein the means is a cooling lid, an opening ~~[(A25)]~~ of the gear housing ~~[(A2, A2', B2)]~~ is closed by ~~[a]~~ the cooling lid ~~[(A9, A9', B9) as means (A9, A9', B9)]~~ and ~~[that]~~ the cooling lid ~~[(A9, A9')]~~ has ~~[in particular]~~ cooling ribs.

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13. (Amended) An ~~[E]~~electro-mechanical drive device according to claim 12, wherein the opening is sealed by a material connection, comprising one of ultra sound welding of the cooling lid ~~[(A9, A9', B9)]~~ to an edge of the opening ~~[(A25) or]~~, and sticking of the cooling lid ~~[(A9, A9', B9)]~~ to an edge of the opening ~~[(A25)]~~ through an adhesive between the cooling lid ~~[(A9, A9', B9)]~~ and an edge of the opening ~~[(A25)]~~.

14. (Twice Amended) An ~~[E]~~electro-mechanical drive device according to claim 1, ~~[characterised in that]~~ wherein conductor panels which are insulated from each other are arranged on the means ~~[(A9, A9', B9, C9, D9, D9', D9'', E9)]~~ to connect at least one structural element~~[s]~~ and at least one interface ~~[s]~~ of the control device ~~[(A5, A5', B5, C5, D5', D5'', E5)]~~.

15. (Amended) An ~~[E]~~electro-mechanical drive device according to claim 14, ~~[characterised in that]~~ wherein the conductor panels have contact elements which can be contacted during fitting of the means~~[(A9, A9', B9, C9, D9, D9', D9'', E9)]~~.

16. (Amended) A ~~[M]~~method for manufacturing an electro-mechanical drive device for adjustment devices of a motor vehicle, ~~[more particularly for a window lifter, which has]~~ wherein the drive device includes in the assembled state:

a gearing in a gear housing~~[(A2, A2', B2, D2, D2', D2'')]~~

an electric motor ~~[(A1, D1, D1'')]~~ mechanically connected to the gearing;

a control device ~~[(A5, A5', B5, D5', D5'', E5)]~~ with a power semi-conductor and mounted in the gear housing ~~[(A2, A2', B2, D2, D2', D2'')]~~ and controlling the electric motor ~~[(A1, D1, D1'')]~~; and

~~[(has)]~~ a means ~~[(A9, A9', B9, D9, D9', D9'', E9)]~~ integrated in

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the gear housing [~~A2, A2', B2, B2, B2', B2', B2''~~] as a heat sink [~~wherein the power semi-conductor is~~], the method comprising:

thermally [coupled] coupling the power semi-conductor to the means [(A9, A9', B9, B9, B9', B9'', E9)] as a heat sink [at the same time as]; and

simultaneously at least one of mounting the means [(A9, A9', B9, B9, B9', B9'', E9)] as a heat sink [or as] and fitting the control device [(A5, A5', B5, B5', B5'', E5)].

17. (Amended) The [M]method according to claim 16, [characterised in that for the purpose of coupling] wherein the means is a heat conducting means [(C9, B9'', E9)] and is fixed as heat sink with the gear housing [(C2, B2'', E2)] on a support plate, and [wherein] the heat conducting means [(C9, B9'', E9)] is pressed against the housing of the power semi-conductor of the control device [(C5, B5'', E5)] through [the] a fastening.

18. (Amended) The [M]method according to claim 16, [characterised in that] wherein the means [(B9)] is moved from a first mechanically stable state without thermal coupling to the power semi-conductor into a second mechanically stable state for coupling in order to thermally couple the means [(B9)] through contact in the second mechanically stable state with the housing [(B5)] of the power semi-conductor.

19. (Amended) The [M]method according to claim 16, [characterised in that] wherein the means is [as means] a cooling lid [(A9, A9')] and is welded by ultrasound into an opening [(A25)] of the gear housing [(A2, A2')] up to contact with the housing [(A9')] of the power semi-conductor.

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20. (Amended) A ~~[Use of a]~~ hermetically sealed gear housing ~~[(D2, D2', D2'')]~~ of an electro-mechanical drive device of an adjustment device for motor vehicles ~~[, more particularly for window lifters,]~~ for diverting waste heat from a power semi-conductor which is integrated in a control device ~~[(D5', D5'', E5)]~~ in the gear housing ~~[(D2, D2', D2'')]~~ wherein at least a part of the gear housing ~~[(D2, D2', D2'')]~~ is thermally coupled to the power semi-conductor to draw off the waste heat.

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